FIGURE 1

- (a) CH₃I, DBU, acetone; (b) DIBAL, toluene -78 °C to rt; (c) PDC, MgSO₄, 4Å molecular sieves, CH₂Cl₂ 74% from 1; (d) Ph₃PCHCO₂CH₃, toluene 95%; (e) (Ph₃P)₃RnCl, H₂. EIOH 80%; (f) DIBAL, toluene -78 °C to rt 99%; (g) Dimethythexylsilyi chloride, DMAP, Et₃N, CH₂Cl₂ 83%.

FIGURE 2

(a) Mg, THF, 65 °C; (b) EtMgBr, 0 °C to rt 69%; (c) Ac_2O , pyridine 77%; (d) (lm)₂S, ClCH₂Cl, 60 °C 94%; (e) n-Bu₃SnH, AlBN, bluene, 110 °C 94%; (f) CrO_3 , H₂SO₄, acetone; (g) MeOH, Accl 88% for 2 steps; (f) CrO_3 , H₂SO₄, acetone.

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FIGURE 3

(a) L-serine benzyl ester hydrochloride, DCC, HOBt, Et₃N, THF 80% for 2 steps; (b) PPh₃, CCl₄, Pr₉NEt, CH₂CN 69%; (c) BrCCl₅, DBU, CH₂Cl₉° C 75%; (d) H₂, Pd(OH)₂/C, EtOA 100%; (e) 1, (COCl₂, 2a. DMF, CH₂Cl₂; ii. 4-cyclohexylbutylammonium chloride, Et₃N, CH₂Cl₂ 78%; (f) NaOH, aqueous THF, 95%.

FIGURE 4

